

PATENT

Raminda U. Madurawe et al.
Application No.: 09/606,252
Page 3

REMARKS

Claims are now pending in this application. Claims have been amended. New claims have been added. Support for the new claims can be found in the specification. No new matter has been added.

Claims 21-26 and 38-40 stand rejected under 35 U.S.C. § 112 first paragraph. Claims 27 and 38-40 stand rejected under 35 U.S.C. § 112 second paragraph. Claims 27-31, 33-36, and 38-40 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kao et al. (U.S. Patent Number 5,492,847). Claims 32 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kao et al. in view of Gilgen et al. (U.S. Patent Number 5,134,085). Claims 21-23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilgen et al. in view of Stolmeijer et al. (U.S. Patent Number 5,384,279). Claim 24 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilgen et al. in view of Stolmeijer et al. and Icel et al. (U.S. Patent Number 5,248,624). Claims 25 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilgen et al. in view of Stolmeijer et al. and Kao et al.

Reconsideration of the rejections and allowance of the claims in light of present and previous amendments and remarks is respectfully requested.

Drawings

The office action summary states that the drawings filed on June 28, 2000 are objected to by the Examiner, and that Applicant may not request that any objection to the drawings may not be held in abeyance. But the detailed action states that these informal drawings are acceptable for examination purposes. The detailed action does not state any objection by the Examiner to the drawings as filed.

In any event, formal drawings will be filed by mail on the same date as the facsimile filing of this amendment and accompanying RCE, and such formal drawings may be considered as part of this response. In the interest of drawing quality, applicants wish to submit the formal drawings by mail.

PATENT

Raminda U. Madurawe et al.
Application No.: 09/606,252
Page 4

Formalities

Claims 21-26 stand rejected under 35 U.S.C. § 112 first paragraph. Specifically, the office action states that "it is not clear how a single mask can be used to accomplish depositing a field implant, depositing a well implant and depositing an enhancement implant." (Office action mailed August 21, 2001, page 2, paragraph 4).

Claim 21 recites "wherein the depositing a field implant, depositing a well implant, and depositing an enhancement implant are done using a single mask." This is supported by the specification, at least at page 9 line 37 to page 10 line 6, which discloses "p-type wells 140, field implants 120, and enhancement implants 130 are formed...the three types of implants may be done [using] a common p-well mask."

Applicants submit that one skilled in the art would appreciate that at least Figures 2A and 2B show how this is done. Specifically, a common p-well mask is used to define the p-well region 140. A field implant is implanted using the same mask. Below the isolation regions 150, the field implant is near the surface, and is shown as regions 120. Where field implant is not slowed by the isolation regions, that is between the isolation regions, the field implant is relatively deep, and is not shown. The enhancement implant also used the same mask. In the channel, the enhancement implant region 135 is shown. In the source and drain regions 105, the doping level of the enhancement implant is insignificant compared to the source/drain doping, and is not shown. Also, since the enhancement implant is blocked by the isolation regions 150, even though the enhancement implant uses the p-well mask, the implant is only shown in the channel area.

Claims 38-40 stand rejected under 35 U.S.C. § 112 first paragraph. Claim 38 recites "wherein the concentration of pocket implant under the gate is nonuniform." Applicants submit that support for this limitation can be found at least at Figures 3 and 4, which show pocket implant regions 310. As can be seen, these regions do not extend uniformly under the gates 110, thus the concentration of pocket implant under the gate is nonuniform.

PATENT

Raminda U. Madurawe et al.
Application No.: 09/606,252
Page 5

The 35 U.S.C. § 112 second paragraph rejections have been obviated by amendment.

35 U.S.C. § 102 RejectionsClaim 27

Claim 27 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Kao et al. But Kao et al. do not teach each and every limitation of this claim. For example, claim 27, as amended, recites "wherein the first pocket implant is near and separated by a small distance from the second pocket implant." Kao et al. do not teach this feature.

In Kao et al. the implants are not near nor are they separated by a small distance. Specifically, Figure 2(g) in Kao et al. shows implant areas 232 below the source and drain region portions 262. The channel edges of the implant areas are shown to be coincident with the source and drain regions. In the device of Figure 2(g), the source drain regions cannot be near each other; if they do, the device will not perform properly. Thus, Kao et al. teach away from manufacturing a structure wherein the first pocket implant is near and separated by a small distance from the second pocket implant. If such a structure is made following the teaching of Kao et al., the source and drain regions would be too close for proper device operation. Accordingly, claim 27 should be allowable for at least these reasons.

Claim 35

Claim 35 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Kao et al. But Kao et al. do not teach each and every limitation of this claim. For example, claim 35, as amended, recites "causing the first pocket implant to merge with the second pocket implant." Kao et al. do not provide this feature.

The office action cites Figures 4A and 4B of Kao et al. as showing the "merging of the first pocket implant and second pocket implant." But these figures do not show two pocket implants, rather, they show a single implant 432. For example, Kao

PATENT

Raminda U. Madurawe et al.
Application No.: 09/606,252
Page 6

et al. at column 6, lines 46-50 describe these figures as showing a MOS transistor "having an APT implant." Thus, these figures in Kao et al. do not show a first and a second pocket implant as required by claim 35. Accordingly, claim 35 should be allowable for at least these reasons.

Claim 38

Claim 38 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Kao et al. But Kao et al. do not teach each and every limitation of this claim. For example, claim 38, as amended, recites "wherein a concentration of the pocket implants under the gate is nonuniform, and the pocket implants extend near the semiconductor substrate surface." Kao et al. do not disclose this feature. Rather, Kao et al. at Figures 2A-2G show pocket implants 232 as being below the source drain regions, and not extending near the semiconductor substrate surface as required by the claim. Accordingly, claim 38 should be allowable.

35 U.S.C. § 103 RejectionsClaim 21

Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilgen et al. in view of Stolmeijer et al. But Gilgen et al. and Stolmeijer et al., when combined, do not show or suggest each and every feature of this claim. For example, claim 21 recites "wherein the depositing a field implant, depositing a well implant, and depositing an enhancement implant are done using a single mask." The combination of Gilgen et al. and Stolmeijer et al. do not show or suggest this feature.

Specifically, Stolmeijer et al. is cited in the office action as showing the use of one mask for three implants. (office action, page 8, first paragraph). But Stolmeijer et al. does not show or suggest this. Rather, Stolmeijer et al. in Figure 1 shows the use a mask for two implants.

PATENT

Raminda U. Madurawe et al.
Application No.: 09/606,252
Page 7

Specifically, column 2, lines 39-44 state "After provision of this mask, the two implantations are carried out with an n-type dopant (n-well implantation and anti-punch-through implantation). Subsequently, the implantation mask is removed..."

Also, at column 6, lines 57-66, Stolmeijer et al. discuss "The first implantation," "The second implantation," and then "After removal of the implantation mask..." It is clear that Stolmeijer et al. teach using this mask for two implantations, not three as required by the claim.

Accordingly, claim 21 should be allowable for at least these reasons.

Other claims

Claims 22-26 depend from claim 21, and should be allowed for the same reason as claim 21, and for the additional limitations they recite. Claims 28-34 and 41 depend from claim 27, and should be allowed for the same reason as claim 27, and for the additional limitations they recite. Claims 36-37 depend from claim 35, and should be allowed for the same reason as claim 35, and for the additional limitations they recite. Claims 39-40 depend from claim 38, and should be allowed for the same reason as claim 35, and for the additional limitations they recite.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal notice of allowance at an early date is respectfully requested.

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NO. 123

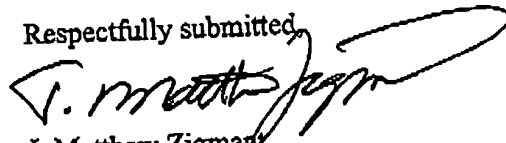
P. 13/14

Raminda U. Madurawe et al.
Application No.: 09/606,252
Page 8

PATENT

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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Raminda U. Madurawe et al.
Application No.: 09/606,252
Page 9

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1 27. (Amended) A method of fabricating a transistor in an integrated
2 circuit device comprising:
3 providing a semiconductor substrate;
4 forming a gate oxide on the semiconductor substrate;
5 forming a gate on the gate oxide;
6 implanting a first pocket implant into the semiconductor substrate from a
7 first side of the gate; and

8 implanting a second pocket implant into the semiconductor substrate from
9 a second side of the gate, wherein the first pocket implant is [approximately in contact
10 with] near and separated by a small distance from the second pocket implant.

1 38. (Amended) A method of fabricating a transistor in an integrated
2 circuit device comprising:
3 providing a semiconductor substrate having a surface;
4 forming a gate oxide on the semiconductor substrate surface;
5 forming a gate on the gate oxide;
6 implanting a first pocket implant into the semiconductor substrate from a
7 first side of the gate at an angle; and
8 implanting a second pocket implant into the semiconductor substrate from
9 a second side of the gate at an angle,
10 wherein [the] a concentration of the pocket [implant] implants under the
11 gate is nonuniform, and the pocket implants extend near the semiconductor substrate
12 surface.